

CLAIMS:

- 1 *Sub 1* An optical channelizer system for dividing up a relatively wide bandwidth optical  
 2 signal into a plurality of subchannels, the optical channelizer system comprising:
- 3 an optical local oscillator (LO) for providing a comb of LO optical frequencies,
  - 4 an optical splitter for spatially dividing said comb of LO optical frequencies into a
  - 5 plurality of LO signals;
  - 6 a device for providing a plurality of replicated versions of the optical signal, each
  - 7 version being translated by a predetermined frequency;
  - 8 an optical channelizer for receiving said replicated optical signals and said plurality
  - 9 of LO signals; and
  - 10 a photo detector array disposed adjacent said optical channelizer for receiving the
  - 11 images of said replicated optical signals and said LO signals.
- 1 2. The optical channelizer system as recited in claim 1, wherein said optical  
 2 channelizer is based upon a diffraction grating.
- 1 3. The optical channelizer system as recited in claim 1, wherein said optical  
 2 channelizer is based upon an integrated optical array wave guide grating.
- 1 4. The optical channelizer system as recited in claim 1, further including an optical  
 2 amplifier for amplifying said LO optical signals.
- 1 5. The optical channelizer system as recited in claim 4, wherein said optical splitter  
 2 and optical amplifier is formed from a monolithic optical splitter/amplifier integrated circuit  
 3 (MOSAIC).

1           6. The optical channelizer as recited in claim 1, wherein said device for providing a  
2 plurality of replicated optical signals is a Bragg cell.

1           7. An optical channelizer system for dividing up a relatively wide bandwidth optical  
2 signal into a plurality of subchannels, the optical channelizer comprising;

3           an optical local oscillator (LO) for providing a comb of LO optical frequencies  
4 defining LO signals;

5           a device for providing a plurality of replicated LO signals; each replicated signal  
6 being translated by a predetermined frequency;

7           an optical splitter for spatially separating said optical signals;

8           an optical channelizer for receiving said plurality of replicated signals from said  
9 device and said optical splitter;

10          a photo detector disposed adjacent said optical channelizer for receiving the images  
11 of said optical and LO signals.

1           8. The optical channelizer system as recited in claim 7, further including an optical  
2 amplifier for amplifying said optical signals.

1           9. The optical channelizer system as recited in claim 7, further including an optical  
2 amplifier and wherein said optical splitter and optical amplifier are formed from a  
3 monolithic optical splitter/amplifier integrated circuit (MOSAIC).

1           10. The optical channelizer as recited in claim 7, wherein said device for providing a  
2 plurality of replicated LO signals is a Bragg cell.

1 11. An optical channelizer system for separating relatively wideband optical signals  
2 into a plurality of sub-channels comprising:

3 a plurality of optical sub-channelizers each subchannelizer including means for  
4 spatially splitting one or the other of said optical signals or said LO signals;  
5 means for replicating and frequency shifting the other of said optical signal or said  
6 LO signals;

7 an optical channelizer for receiving signals from said splitting means and said  
8 replicating means; and

9 a photo detector array for receiving the images of said signals from said optical  
10 channelizer.

1 12. The optical channelizer system as recited in claim 11, wherein said optical  
2 channelizer includes a diffraction grating.

1 13. The optical channelizer system as recited in claim 11, wherein said replicating  
2 means includes a Bragg cell.

1 14. The optical channelizer system as recited in claim 11, further including an  
2 optical amplifier.

1 15. The optical channelizer system as recited in claim 14, wherein said optical  
2 amplifier and said splitting means are formed from monolithic optical splitter/optical  
3 amplifier integrated circuit (MOSAIC).